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Implementation of Business Intelligence for Monitoring Technician Performance Using Google Looker Studio (Case Study: PT Telkom Akses Bengkulu)

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Abstract*—IndiHome's customer service disruption handling activities at PT Telkom Akses Bengkulu produce operational data that continue to grow every day, but the data is still managed in the form of scattered raw data, making it difficult to monitor and analyze the performance of technicians. The purpose of this practical work is to process data on handling customer service interruptions, monitor technician performance, and present information in the form of an easy-to-understand dashboard. The method used in this study is business intelligence with the stages of data cleaning, data transformation, and data visualization, using Google Looker Studio as a data visualization tool. The data used is operational data on technician assignments in the period of the end of 2025 to early 2026 with a total of 448 work data points that include the name of the technician and the work area. The results of the study indicated that the dashboard was able to present information on the number of technician jobs, the average job per technician, and the distribution of jobs by region in a more structured manner. The dashboard can also show which technicians have the most jobs and how much each technician's work contributes, which makes it easier to keep track of the performance process. With the application of this business intelligence, companies can monitor the performance of technicians more effectively and support data-based decisionmaking.

Keywords- Business Intelligence, Dashboard, Performance Monitoring, Data Visualization, Technician Performance

I. INTRODUCTION

IndiHome's customer service disruption-handling activities at PT Telkom Akses Bengkulu involve many technicians with an increasing volume of work data every day. In its implementation, technician work data is still managed in the form of raw data scattered across various media such as Microsoft Excel files and communication through Telegram, causing the process of monitoring and evaluating technician performance to become less optimal. This condition makes it difficult for the company to obtain information related to the number of jobs, task distribution, and performance comparisons among technicians, and also has the potential to cause delays in operational decisionmaking processes. In addition, data that has not been integrated also affects the imbalance of workload distribution among technicians because the company is not yet able to monitor job distribution comprehensively. This condition may result in some technicians receiving more jobs than others, thereby reducing operational effectiveness and making the process of handling customer service disruptions less optimal. As the volume of data continues to increase, manual data processing becomes less effective and has the potential to produce less accurate information [1].

One approach that can be used to overcome these problems is Business Intelligence (BI), which is a technology used to collect, process, and analyze data to support decision-making [2]. BI enables organizations to transform raw data into valuable information and support data analysis more effectively [3]. In its implementation, BI is generally presented in the form of dashboards that can display information visually, interactively, and in real time, making the process of monitoring and analyzing data easier [4], [5]. Previous studies have shown that business intelligence dashboards can support operational monitoring and improve the effectiveness of decision-making processes in various fields, including service and telecommunication sectors [6], [7]. In addition, the use of Google Looker Studio as a data visualization tool has also been widely implemented to present operational data in a more interactive and easy-tounderstand manner [8]. However, studies that specifically discuss monitoring technician performance in handling customer service disruptions using Google Looker Studio in telecommunication companies are still limited. Therefore, this study aims to develop a business intelligence dashboard that can support technician performance monitoring and assist data-based decision-making processes at PT Telkom Akses Bengkulu.

The application of a business intelligence-based dashboard has several advantages, namely being able to present information visually and in a structured manner, simplifying the data analysis process, and supporting rapid decisionmaking [9]. However, the implementation of BI also has limitations, such as reliance on data quality and the need for good data integration so that the information generated remains accurate, which can lead to misinformed decisions if not properly addressed [10]. Previous research has shown that the implementation of BI-based dashboards can increase the

effectiveness of monitoring and data analysis in various fields, so it can help organizations better understand operational conditions [9], [11].

Based on these problems, this study aims to process technician assignment data into more structured information, build a business intelligence dashboard to monitor technician performance using Google Looker Studio, and support the data-based decision-making process at PT Telkom Akses Bengkulu. The formulation of the problem in this study includes how to process data to make it more structured, how to build an informative dashboard, and how the dashboard can help increase the effectiveness of monitoring and decision-making by providing information on the number of jobs, area distribution, and technician performance

II. RESEARCH METHOD

This study uses the Business Intelligence (BI) approach as the main method in processing operational data into structured information and supporting the decision-making process. Business intelligence is an approach that is able to integrate data from various sources, process data, and present information in visual form that is easy for users to understand [11]. This method was chosen because it is in accordance with the problems faced, namely data that is still scattered and has not been integrated, making it difficult to monitor the performance of technicians and potentially causing inefficiencies in operational activities and delays in decision-making processes.

Data collection in this study was carried out through a documentation study of technician assignment data at PT Telkom Akses Bengkulu. The data used is operational data in the form of Microsoft Excel files from the period of the end of 2025 to the beginning of 2026, with a total of 448 work data points. The data includes several attributes, such as technician names, work areas, number of jobs, work dates, and technician assignment information used as the basis for the data analysis and visualization process. The flow diagram in Figure 1 describes the stages of the Business Intelligence implementation process carried out in this study.

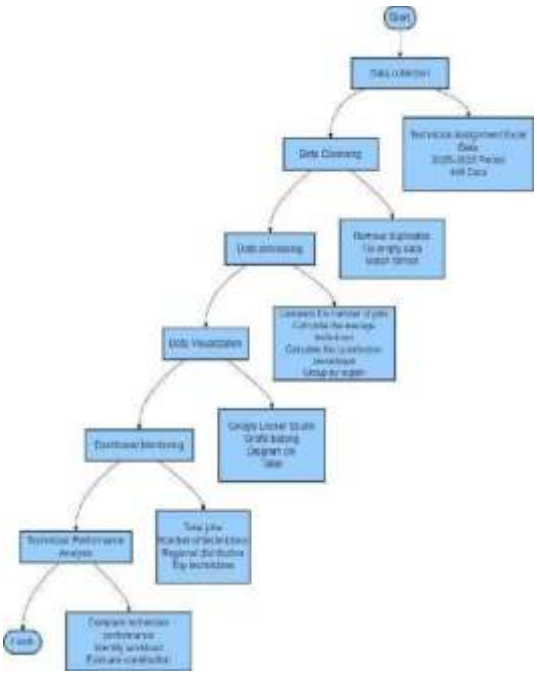


Fig. 1. Business Intelligence Deployment

Figure 1 shows the data processing flow in this study, which begins with the data collection stage obtained from Microsoft Excel files through documentation studies. The next stage is data cleaning, which is carried out to ensure data quality before analysis. The cleaning process includes removing duplicate data, correcting incomplete data, standardizing data writing formats such as technician names and work areas, and removing irrelevant data to produce more structured and consistent data.

After the data cleaning process is completed, the next stage is data transformation and processing by grouping the data based on technicians and work areas. At this stage, several technician performance indicators are calculated, including the number of completed jobs, the average number of jobs per technician, job distribution by region, and each technician's contribution to the total number of jobs. This process is carried out to generate structured information that is ready for visualization and further analysis [12].

The next stage is data visualization using Google Looker Studio in the form of an interactive dashboard. The dashboard displays several types of visualizations, including scorecards to present the total number of jobs, number of technicians, number of work areas, and average jobs per technician; pie charts to show the distribution of jobs by region; bar charts to compare the number of jobs among technicians; and tables to display detailed technician contribution data. These visualizations are used to simplify the monitoring and analysis process and provide information in a more structured and easy-to-understand form [13].

To ensure that the developed dashboard meets the company's operational needs, a validation process was conducted by comparing the dashboard visualization results with the original operational data from Microsoft Excel files. In addition, validation was also carried out by checking the consistency of the displayed information with actual operational conditions to ensure that the dashboard provides accurate information and can support data-based decisionmaking processes.

III. RESULT AND DISCUSSIONS

Based on the dashboard visualization results, it can be seen that the distribution of technician workloads is still uneven. Several technicians handle a significantly higher number of jobs compared to others, indicating that the workload distribution process has not been fully balanced. This condition may affect the effectiveness of operational activities because technicians with excessive workloads may experience decreased productivity and longer service handling times. On the other hand, technicians with fewer assignments may not be utilized optimally. Therefore, the dashboard can help the company evaluate and redistribute workloads more evenly among technicians.

The dashboard results also show that certain technicians contribute dominantly to the completion of customer service disruption handling tasks. This indicates that several technicians have a higher level of involvement in operational activities, which may be influenced by factors such as experience, expertise, or assignment intensity. However, the dominance of certain technicians can also indicate an

imbalance in work distribution that may potentially lead to workload accumulation on specific individuals. Through this dashboard, management can identify technician performance more effectively and use the information as a basis for operational evaluation and workforce management.

In addition, the visualization of work distribution by region indicates that several areas have a higher number of service disruptions compared to others. Regions with high disruption intensity can be categorized as areas requiring greater operational attention because they may indicate high customer density, network quality issues, or infrastructure problems. This information can support the company in determining priority areas for maintenance, improving service quality, and allocating technicians based on operational needs in each region.

The implementation of the Business Intelligence dashboard using Google Looker Studio also provides managerial benefits for PT Telkom Akses Bengkulu. The dashboard enables management to monitor technician performance, workload distribution, and regional operational conditions more quickly and interactively. In addition, the information presented through the dashboard can support data-based decision-making processes, such as technician workload evaluation, operational planning, and prioritization of customer service disruption handling. Therefore, the dashboard not only functions as a data visualization tool but also as a decision-support tool for improving operational effectiveness and service quality.

A. Data Processing into Structured Information

In the early stages, the data on technician assignments obtained from the company is still in the form of raw data that has not been properly structured. Therefore, the data cleaning process is carried out by removing duplicates, correcting incomplete data, and equalizing the writing format so that the data can be processed properly. Next, we group the data by technician and work area.

Through this process, several important pieces of information are obtained, such as the number of jobs completed by each technician, the average work per technician, and the contribution of each technician to the total work. This data processing is crucial because it serves as the foundation for developing dashboards. Without effective data processing, the information generated will not be accurate, and it will be difficult to analyze.

B. 3.2 Construction of Technician Performance Monitoring Dashboard

After the data has been successfully processed, the next step is to implement it in the form of a dashboard using Google Looker Studio. Figure 2 displays the resulting dashboard.



Fig. 2. PT Telkom Access's Technician Performance Monitoring Dashboard

In Figure 2, this dashboard displays several main indicators, such as the total number of jobs—as many as 448 jobs; the number of technicians—as many as 122 people; the number of regions—as many as 4 regions; and the average work per technician—3.7 jobs. This indicator provides an initial overview of the overall working conditions of technicians. In addition, the dashboard also displays a graph of regional distribution, a graph of technician performance, and a table of technician data that is the basis for the analysis process, so that data that was previously scattered can be seen in one integrated view and facilitate the monitoring process.

The indicators displayed at the top of the dashboard not only serve as general information but also reflect operational conditions in the field. The average job value per technician of 3.7 indicates that, in general, each technician handles about 3–4 jobs. The average value doesn't show a completely even condition, as the graph shows a difference in the number of jobs among technicians. This figure shows that workload imbalances can be caused by assignment area factors, technician experience, and regional disruption levels.

C. Technician Performance Analysis

To determine the distribution of technician work by region, data visualization was done in the form of a pie chart. This visualization is used to provide an overview of the proportion of work in each region so that it is easier to conduct a comparative analysis of workloads.

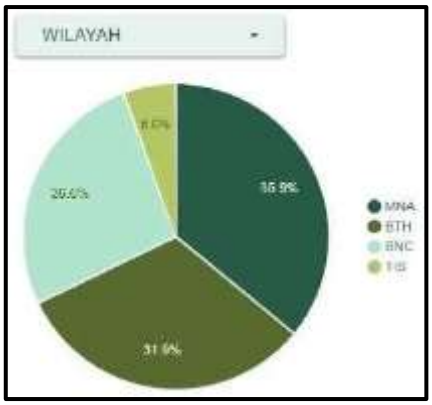


Fig. 3. Distribution of Work by Region

In Figure 3, it can be seen that the MNA (Middle North America) region has the highest percentage of employment at 35.9%, followed by BTH (Beltway Tech Hub) at 31.9%, then BNC (Basin North Central) at 26.6%, and TIS (Tech Innovation Sector) at 5.6%. This difference indicates an uneven distribution of jobs across regions.

The high percentage in the MNA area is likely due to the high number of customers or frequent network disruptions in the area. This disparity causes technicians in charge of the MNA region to handle more work than other regions. Additionally, the higher workload may be due to the area's wider service coverage, which requires more attention.

In contrast, regions like TIS have a much lower number of jobs. This discrepancy indicates that technicians in the region may not be performing effectively, possibly because the

region experiences lower levels of disruption or has fewer customers. Another possibility is that the region has fewer technicians or that the work concentrates on specific disruptions. This condition shows that the division of work between regions is uneven, so the distribution of technicians needs to be evaluated to balance the workload.

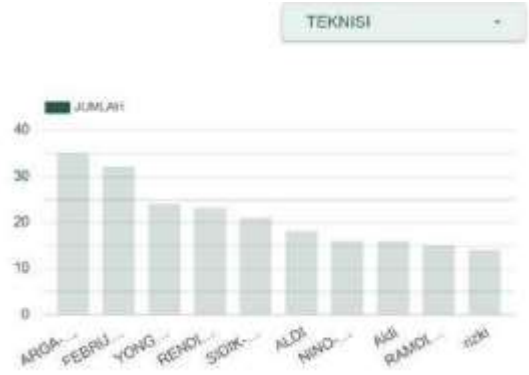


Fig. 4. Number of Jobs per Technician

Figure 4 shows the number of jobs completed by each technician. The data reveals a significant difference in stem height among technicians. Technicians such as ARGA-DERRY and FEBRU-DEBI have more jobs than other technicians.

A high number of jobs for a particular technician can indicate that the technician has a higher level of productivity, better experience, or special skills so that they receive assignments more often. However, this condition can also indicate a greater workload than other technicians.

In contrast, technicians with a lower number of jobs do not necessarily show poor performance. The assignment area, fewer distractions, or the technician's adaptation stage may cause such results. Therefore, this difference should be considered when dividing tasks to ensure a more equitable and optimal distribution. The table on the dashboard is used to support the analysis by displaying detailed information about technicians and their contributions. This information makes it easier to compare technician performance in more detail.

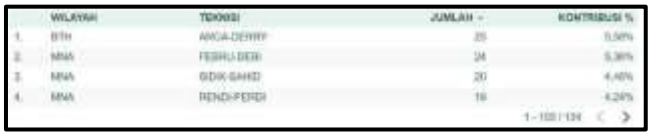


Fig. 5. Technician Performance Data Table

The table on the dashboard displays detailed data about technicians, which includes their work area, number of jobs, and contributions in the form of percentages. Technicians with high contributions play a large role in getting the job done, while technicians with low contributions need to be further analyzed to determine whether they are due to regional factors, experience, or the division of tasks. High-contribution technicians play a significant role in completing tasks, while low-contribution technicians require further analysis to determine if their performance is affected by regional factors, experience, or task division. This table is very beneficial in conducting evaluations because it provides more detailed data than graphs.

D. Discussion

Based on the results obtained, it can be concluded that the application of business intelligence in the form of a dashboard is able to provide a clear picture of technician performance. The dashboard that is built not only displays data but also helps in understanding operational conditions in the field.

Through this dashboard, the company can see the differences in workload between regions and the difference in performance between technicians. This information is critical in supporting decision-making, such as adjusting the division of tasks, adding technicians in certain areas, and evaluating technician performance.

However, this study still has limitations; namely, the data used does not include other factors such as the level of difficulty of the work, completion time, and direct field conditions. Therefore, researchers can enhance the analysis by incorporating these variables, resulting in a more accurate and in-depth study.

IV. CONCLUSION

This research succeeded in achieving the goals that have been set, namely processing data on handling customer service interruptions into more structured information, building a business intelligence dashboard using Google Looker Studio, and utilizing the dashboard to support the process of monitoring and analyzing the performance of technicians. The resulting dashboard is able to visually present information related to the number of jobs, regional distribution, and technician performance, making it easier to understand operational conditions and support datadriven decision-making.

However, this study still has limitations, including that the data used do not include more complex variables and the analysis carried out is still descriptive. Therefore, further research can be developed by adding other variables, such as work completion time and the success rate of handling the disorder, as well as further analysis methods, such as predictions or recommendations, to produce more in-depth and optimal information.

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